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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/606,182  | 06/26/2003  | Tsutomu Hashizume    | Q76316              | 1591             |
| 7590  | 12/15/2004  |                      | EXAMINER            |                  |
| SUGHRUE, MION, ZINN, MACPEAK & SEAS<br>2100 Pennsylvania Avenue, N.W.<br>Washington, DC 20037 |             |                      | FEGGINS, KRISTAL J  |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2861                |                  |

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

|                              |                        |                     |
|------------------------------|------------------------|---------------------|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |
|                              | 10/606,182             | HASHIZUME ET AL.    |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |
|                              | K. Feggins             | 2861                |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 26 June 2003.

2a) This action is **FINAL**.                    2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 21-33 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 21-33 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. 08/788,959.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

|  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>6/26/2003</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 21-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Miyashita et al. (US 6140746).

#### **Miyashita et al. disclose the following claimed limitations:**

\* regarding claims 21, 25 & 30 an ink jet recording head formed by a method and a method of manufacturing an ink jet recording head (Abstract, fig 4);

\* forming a first/lower/ electrode layer/23/ on a diaphragm/22/ (col 10, lines 27-34, fig 4);

\* forming a piezoelectric layer24/ on the first/lower/ electrode layer/23/ (col 10, lines 27-34, fig 4);

\* forming a second/upper/ electrode layer/25/ on the piezoelectric layer/24/ (col 10, lines 27-34, fig 4);

\* etching completely through the second/upper/ electrode layer/25/, the piezoelectric layer/24/, and the first/lower/ electrode layer/23/ so that a portion/the ends/ of the diaphragm/22/ is exposed (col 11, lines 56-66, figs 3 & 4).

\* regarding claims 22, 26 & 31, wherein the diaphragm/22/ is attached to a substrate/21/(col 10, lines fig 4);

\* regarding claim 29, wherein only a single mask material is used to pattern the second electrode layer, the piezoelectric layer, and the first electrode layer during the etching step (col 11, lines 20-40, 56-67, col 12, lines 1-9, fig 3).

\* further regarding claim 30, etching completely through at least the second electrode layer and the piezoelectric layer so that a portion of the diaphragm is exposed (col 11, lines 20-40, 56-67, col 12, lines 1-9, fig 3).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 23, 24, 27, 28, 32, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyashita et al. (US 6140746) in view of Miyata et al. (US 5,754,205).

**Miyashita et al. disclose all of the claimed limitations except for the following:**

\* regarding claims 23, 27 & 32, wherein a nozzle plate is attached to the substrate.

\* regarding claims 24, 28 & 33, wherein the nozzle plate is formed with a nozzle orifice.

**Miyata et al. disclose the following claimed limitations:**

\* regarding claims 23, 27 & 32, wherein a nozzle plate/53/ is attached to the substrate (col 7, lines 39-42, fig 3b) for the purpose of providing a plurality of nozzle openings fixed to one face of the substrate.

\* regarding claims 24, 28 & 33, wherein the nozzle plate/53/ is formed with a nozzle orifice/52/ (col 7, lines 39-42, fig 3b) for the purpose of ejecting ink drops through the nozzle opening.

It would have been obvious at the time of the invention was made to a person having ordinary skill in the art to utilize a nozzle plate is attached to the substrate; and a nozzle plate that is formed with a nozzle orifice, taught by Miyata et al. into Miyashita et al. for the purposes of providing a plurality of nozzle openings fixed to one face of the substrate and ejecting ink drops through the nozzle opening.

***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hasegawa et al. disclose a liquid jet head having a silicon substrate, a piezoelectric device, upper and lower electrodes and a piezoelectric film.

### **Communication With The USPTO**

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Feggins whose telephone number is 571-272-2254. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
K. Feggins  
Primary Examiner  
December 10, 2004